Search for a Spanish Partner for a Bilateral R&D Project

Organization	
Date of Request:	19 October 2026
Company name:	Pharos University in Alexandria (PUA) – **Faculty of Engineering**
Contact person and title/ designation:	Dr. Heba Fahmy – Assistant Lecturer, Mechanical Engineering Department, Faculty of Engineering, Pharos University in Alexandria (PUA)
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SECTION 1: Entity launching the partner search *(Please give brief / to the point explanations. For more explanation on any point below, you may add a short paragraph as an annexure, with this document.)*	
Sector	Higher education and applied engineering research. Relevant fields within the Faculty of Engineering: mechanical engineering (industrial and manufacturing engineering; mechanical power engineering; mechatronics), the area most closely linked to this partner search; petrochemical engineering (including polymer science); electrical power and control; electronics and communications; computer engineering; construction engineering and management; architecture.
Entity mission or core functions	The Faculty of Engineering is the engineering faculty of Pharos University in Alexandria. Its stated mission is to provide engineering education and professional skills; to raise the level of scientific research through international cooperation with foreign universities; to build a closer relationship with local industry and adapt research to industrial and technological problems; and to serve the local community and the surrounding environment.
Date of establishment	Pharos University in Alexandria: Republican Decree No. 252, 15 July 2006. Faculty of Engineering: established in 2006.
Ownership (if public and traded, add stock exchange and ticker symbol)	Private university in Egypt (described by PUA as the first private university in Alexandria), established by Republican Decree No. 252 of 2006. Not publicly traded.
Total number of employees	Approximately 200 personnel, including academic staff, administrative staff and laboratory technicians.
Number of employees in R&D	R&D activities are undertaken by academic staff across the faculty's departments; i.e. the School of Materials Technology alone includes approximately 12 researchers.
Key products sold or services provided	As a higher-education institution, the Faculty's principal outputs and services include: – B.Sc. engineering graduates equipped with the technical and professional competencies required to compete in the Egyptian and international labour markets;

	– postgraduate education leading to Master's degrees, with research addressing academic and industrial challenges; – graduates and postgraduate alumni who have successfully pursued professional careers and further studies internationally, including in Europe, Gulf countries and Australia; – scientific research and publication, including the Pharos Engineering Science Journal (PES); – organization of scientific conferences, including the International Conference on New Trends in Sustainable Energy (ICNTSE); – industry-linked student training, field visits and graduation projects; – professional engineering training and capacity-building activities, including recurring summer training by the Mechanical Engineering Department for Libyan engineers in maintenance engineering, vibration analysis and machinery fault detection and diagnosis.
Entity core technical competences	*Mechanical engineering:* – Industrial and manufacturing engineering: manufacturing processes, metal cutting and non-traditional machining, joining, forming and casting, CNC machine tools, metrology (CNC, welding, casting, forging, sheet-metal and metal-working workshops); – Mechanical design and engineering prototyping, including design-to-build of functional laboratory equipment; – Engineering materials and materials testing (Material Testing Laboratories); materials research within the School of Materials Technology; – Mechanical power and thermal engineering: fluid mechanics, thermodynamics and heat transfer, internal combustion engines; – Mechatronics, automation and automatic control, and electrical power (Energy and Automatic Control Laboratory); – Maintenance engineering, vibration analysis, machinery condition monitoring and fault diagnosis; *Other Faculty disciplines:* – Petrochemical engineering: polymer science and engineering, plastic industry, environmental engineering, industrial wastewater treatment (chemistry laboratories); – Electronics, microprocessors and computer engineering; – Sustainability-oriented engineering in energy, industry and the built environment.
Key R&D programs and activities	– School of Materials Technology: materials and polymer research, including polymer recycling and sustainable materials; – Sustainability-oriented research: ICNTSE conference series (2018, 2020, 2021, 2024); the 2024 edition, co-organized with KTH Royal Institute of Technology, covered sustainability and digital transition in energy, the built environment and industry; – Applied research with industry relevance, including environmental services for the oil, gas, polymer and petrochemical sectors (Petrochemical Engineering Department goal); – Postgraduate research (Master's and PhD) and the Pharos Engineering Science Journal; industry-oriented postgraduate research is also conducted with industrial partners, including RUBEX Plastics, addressing practical industrial problems; – Applied engineering projects, including industry-linked and externally supported graduation projects (e.g., Birla Carbon “Towards a Sustainable Future” contest), several developed

	into functional laboratory equipment; – Relevant expertise of the contact person (Dr. Heba Fahmy) includes plastic-waste recycling, sustainable polymer processing and additive manufacturing using recycled polymer feedstocks. Competitive funding and externally supported projects: – selected graduation projects have received competitive funding from the Egyptian Engineers Syndicate and the Academy of Scientific Research and Technology (ASRT), following proposal submission and evaluation; – promising course-based mini-projects have also competed for support through the Innovators Support Fund (ISF); in a regional evaluation involving universities across Alexandria and the Delta region, PUA projects secured two of the three available funded positions; – research projects supported by STDF; – an Electrical Engineering research project conducted in cooperation with ITIDA Egypt.
Examples of accomplishments	– Faculty accredited by the National Authority for Quality Assurance and Accreditation in Education (NAQAAE); – Partnership with KTH Royal Institute of Technology (Sweden) since 2012: KTH-PUA dual-certificate programs; eight B.Sc. programs validated and quality-assessed by KTH; – Fourth ICNTSE conference (November 2024), organized jointly with KTH; – Cooperation protocol with Birla Carbon (“Towards a Sustainable Future”); Faculty engineering projects, including Mechanical Engineering projects, participate regularly in this sustainability-focused student competition and have achieved winning positions across multiple years; – Industry field training and visits, including Sidpec (polyethylene producer). *Research and innovation:* – Patents/patent applications by Faculty researchers in waste-to-biofuel conversion; polymer recycling (including recycling polyester waste into basic chemical building units); sustainable polymer additives/plasticizers; eco-friendly polymer/composite materials; sustainable flame-retardant materials. At least one application was accepted in 2025; – Development of a novel material/compound through collaboration between academic and laboratory research personnel. *Applied engineering and student innovation:* – Several graduation projects developed into functional engineering systems that remain in use in Faculty laboratories, including a Smart Urine Bag system, Precision Cutting Laser Machine, Sand Abrasion Cutting Machine, Winding Machine and Robotic Arm; – Competitively funded graduation projects include a Dry-Ice Deep-Cleaning system and a Bladeless Wind Turbine; the latter represented the Faculty in an Arab-level competition in Jordan associated with Al-Petra University and achieved a winning result. – Hult Prize: a sustainability/materials project ranked first at Pharos University, reached the semifinals and represented the University in Tunis; a Mechanical Engineering humanoid robot project achieved a regional (Arab-level) winning result at the regional competition held in Egypt.
Company strategic orientation	*Research and collaboration orientation:* – applied engineering research directed at industrial and technological problems; – closer university–industry collaboration, nationally and

	internationally; – international academic and research cooperation (e.g., KTH in Sweden, Heilbronn University in Germany); – sustainability in energy, industry and the built environment; – for this initiative: joint R&D with industrial partners on plastic waste valorization and recycled-feedstock additive manufacturing, moving laboratory results towards validated processes and prototypes.

SECTION 2: Spanish Company Profile *(Please provide a brief summary of the prospective partner company or organization. This summary may address some or all of the points below)*	
Profile of ideal technology partner	A Spanish industrial company (SME or large company) active in plastic waste treatment, recycling, waste valorization or recycled-polymer technologies, preferably with in-house R&D and interest in a bilateral R&D project. The waste stream is open: post-consumer, post-industrial, difficult-to-recycle or contaminated plastics, or other technically relevant polymer waste streams. Specialization in medical waste is not required. The partner would contribute the upstream part of the project (waste to quality-controlled recycled feedstock), which complements the Egyptian consortium's expertise.
Core technological competencies and expertise	*One or more of the following (the partner does not need to cover all):* plastic waste identification/sorting; pretreatment and washing; decontamination and removal of contaminants, odour and impurities; mechanical recycling; advanced recycling where technically appropriate; polymer recovery; recycled-polymer upgrading, formulation and compounding; recyclate quality control; production of consistent recycled feedstock/pellets; pilot or industrial-scale validation.
Other essential qualifications (e.g.: ownership, track records etc.)	*Desirable:* – established industrial activity in Spain; – R&D capability and willingness to take part in collaborative R&D; – access to representative waste streams and/or pilot or industrial facilities; – interest in joint technology development and scale-up. Previous CDTI, EU or international R&D project experience is an advantage, not a requirement.
If you have a list of companies with whom you are in contact or interested in contacting, please provide contact details	Fych Technologies – contacted by e-mail and LinkedIn regarding potential collaboration; no formal response received to date. Suggestions of other suitable companies by CDTI are welcome.
If you are interested in collaboration: please specify details and other important information you want to share with a potential company	**Project concept (to be jointly defined):** plastic waste → identification/sorting → pretreatment → cleaning/decontamination → recycling/material upgrading → recycled polymer feedstock/pellets → direct pellet-fed additive manufacturing → value-added manufactured applications. The waste stream, treatment route, material formulation and end-use application will be selected jointly with the Spanish partner. Different polymers may need different pretreatment, drying, compounding

	and printing conditions. **Intended complementarity:** **Spanish industrial partner:** waste treatment/recycling; waste streams; decontamination and material upgrading; recycled-feedstock quality; pilot/industrial validation. **PUA – Faculty of Engineering (academic R&D partner):** materials and recycling research; characterization; process optimization; additive manufacturing research; engineering analysis/design; sustainability/circularity assessment; technical validation. **ROBOTA Industries LLC, Borg El Arab, Alexandria (Egyptian industrial R&D partner):** machine development; mechanical/mechatronic design; automation/control; electronics and embedded systems; pellet-fed additive manufacturing; prototype engineering/manufacturing; engineering scale-up. Examples: ongoing development of a machine for additive manufacturing with recycled metals (with the Faculty of Engineering, Ain Shams University); a bioprinting system delivered to the Faculty of Pharmacy, Ain Shams University; pellet-fed 3D printing systems delivered to the Faculty of Engineering, E-JUST.
Interested areas of collaboration	Plastic waste treatment and valorization; circular polymer technologies; recycling and decontamination; recycled-polymer formulation/compounding; recycled feedstock development; direct pellet-fed additive manufacturing; sustainable/circular manufacturing; automated processing; industrial validation and scale-up; technology transfer.
Specific R&D contribution you are seeking/offering	**Seeking from the Spanish partner:** industrial waste-treatment/recycling know-how; selection and pretreatment of suitable waste streams; decontamination; recycled-material upgrading/compounding where relevant; feedstock quality and consistency; access to representative waste streams; pilot/industrial validation; contribution to scale-up and exploitation. **Offering from the Egyptian consortium:** **PUA – Faculty of Engineering can contribute:** materials/recycling research; characterization; process optimization; additive manufacturing research; engineering analysis; sustainability/circularity assessment; technical validation. **ROBOTA Industries can contribute:** customized machine development; mechanical/mechatronic engineering; automation/control; electronics/embedded systems; adaptation or development of pellet-fed extrusion and AM systems for recycled feedstocks; prototype engineering/manufacturing; engineering scale-up. The partners would jointly develop and validate the full waste-to-product route.

Heba Fahmy

Signature

Name: Dr. Heba Fahmy

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